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SPECIFICATION FOR COAL DUST FOR USE IN CAST IRON FOUNDRY

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NEW DELHI 110002

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SPECIFICATION FOR COAL DUST FOR USE IN CAST IRON FOUNDRY

(Second Revision)

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SPECIFICATION FOR COAL DUST FOR USE IN CAST IRON FOUNDRY

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 7 September 1973, after the draft finalized by the Foundry Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 A number of materials are used in foundry to give protection to the mould and core surface against the action of molten metal, and help in producing a smooth and clean skin on the castings.

0.2.1 Bituminous coal dust is one of the carbonaceous facing materials being mixed with green sands in foundry. When molten metal comes in contact with mould surfaces containing coal dust, a gaseous envelope is formed which resists the fusion of sand to the metal. A tar product is also formed which has a binder effect near the face of the mould. Its use improves casting finish, increases both dry and green strength and also reduces expansion.

0.3 This standard was first published in 1961 and revised in 1967 to incorporate maximum permissible limits for phosphorus in coal dust. Keeping in view the availability of coal in the country, limits for volatile matter and ash content have been modified for the various grades of material in this revision.

0.4 This standard keeps in view the manufacturing and trade practices followed in the country in this field.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers the requirements for coal dust for use in foundries.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of coal dust for use in cast iron foundry shall be as laid down in IS : 1387-1967*.

2.2 The material shall consist of high quality finely crushed bituminous coal and shall be free from foreign material, such as iron pyrites and slate, which may prove injurious to the castings.

3. GRADES

3.1 Coal dust for use in foundry shall be of three grades, namely, Grades 1, 2 and 3, according to chemical composition. They shall further be classified into three grades, namely, Grades F, M and C with respect to grain fineness. For example, coal dust falling under Grade 2 according to chemical composition and Grade M with respect to grain fineness shall be designated as Grade 2M.

4. REQUIREMENTS

4.1 Coal dust, when analyzed in accordance with IS : 1350 (Part I)-1969† and IS : 1350 (Part III)-1969‡ shall conform to the requirements given in Table 1.

TABLE 1 REQUIREMENTS OF COAL DUST

Sl No.	Characteristic	Requirement, Percent by Mass		
		Grade 1	Grade 2	Grade 3
(1)	(2)	(3)	(4)	(5)
i)	Moisture, *Max*	3·0	3·0	3·0
ii)	Proximate analysis, on dry basis:			
	a) Volatile matter, *Min*	33	28	22
	b) Ash, *Max*	18	20	22
	c) Fixed carbon (by difference)	← To be reported →		
iii)	Sulphur, on dry basis, *Max*	1·0	1·0	1·0
iv)	Phosphorus, on dry basis, *Max*	0·20	0·20	0·20

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*General requirements for the supply of metallurgical materials (*first revision*).

†Methods of test for coal and coke: Part I Proximate analysis (*first revision*).

‡Methods of test for coal and coke: Part III Determination of sulphur (*first revision*).

4.2 Fineness — The fineness of different grades of coal dust shall conform to the requirements specified in Table 2.

TABLE 2 FINENESS OF DIFFERENT GRADES OF COAL DUST

GRADE	PERCENTAGE WEIGHT OF MATERIAL TO PASS THROUGH *IS SIEVE (MICRON)					
	600-micron	300-micron	212-micron	106-micron	75-micron	53-micron
(1)	(2)	(3)	(4)	(5)	(6)	(7)
F (Fine)	—	—	100	75	—	20
M (Medium)	—	100	80	—	30	—
C (Coarse)	100	80	—	—	20	—

NOTE — When IS Sieves are not available, equivalent BS or ASTM Test Sieves specified in Appendix A may be used. The BS and ASTM Sieves listed in Appendix A have their apertures within the limits specified for the corresponding IS Sieves.

*See IS : 460-1962 ' Specification for test sieves (*revised*) '.

5. SAMPLING

5.1 Representative samples shall be drawn according to the scheme of sampling given in IS:436 (Part I)-1964*.

6. PACKING

6.1 Unless specified otherwise, the material shall be supplied in polythene lined gunny or paper bags each containing 50 kg.

NOTE — Gunny bags containing coal dust are liable to catch fire in hot and dry weather. The bags may, therefore, be suitably treated before packing.

7. MARKING

7.1 The bags shall have a tag clearly marked with the manufacturer's name or trade-mark and grade of the material.

7.2 The material may also be marked with the Standard Mark.

7.3 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the rules and regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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*Methods for sampling of coal and coke: Part I Sampling of coal (*revised*).

APPENDIX A

(*Note Under Table* 2)

COMPARATIVE SIEVE DESIGNATIONS OF IS, BS AND ASTM TEST SIEVES

IS Sieve	*BS Sieve*	*ASTM Sieve*
600-micron	25	595 (30)
300-micron	52	297 (50)
212-micron	72	210 (70)
106-micron	150	105 (140)
75-micron	200	74 (200)
53-micron	300	53 (270)

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